

DICTIONARY OF TEXTILE TERMS.

Rib: The name given to any kind of cord effect; or to a weave in which, either owing to the interlacing or to the yarns used, warp or filling is the stronger, and remains comparatively straight, while the weaker does all the bending. Thus, in the warp ribs, the filling is the stronger, and causes the warp to bend and form a warp surface rib running from selvage to selvage, while in filling ribs the warp is the stronger, and develops a filling surface rib running lengthwise of the piece.

Ribbed Hosiery: The opposite from fine-gauge. This class of hosiery is produced on a machine having two sets of needles, one set on the cylinder and the other on the dial, the number of needles being less than those used on a fine-gauge machine. The rib stitch is produced by arranging the cams so that certain needles, instead of knitting a single stitch, combine several together, in this way securing greater elasticity and thickness than with the plain stitch, thus knitting a fabric the surface of which is covered with ridges or wales at regular intervals.

Ribbon: A narrow web of silk, cotton, or any other fibre. The shuttle of the ribbon loom is not thrown, but is governed by a positive motion. It is in this particular method of the shuttle motion, and other necessary arrangements for narrow webs, that the ribbon loom differs from other looms.

As to width, ribbons are measured by the line, one-eleventh part of an inch, which is the standard, although in Europe some of the houses adapt various actual widths for the line. In England, the old Coventry method of measuring width of ribbons (taking the thickness of the old English penny as basis) is still in vogue for saracenet ribbons. The length of a piece of ribbon in the trade is often 10 yards, in England usually 36 yards and for velvet ribbons, 18 yards.

Ribbon Feeding System: One of the intermediate systems of feeding a set of woolen cards: also known as the *Scotch Feed*. By the same, the film is combed off the doffer cylinder by means of the doffer comb, is laid upon an endless apron traveling the width of the card parallel to the doffer, and is drawn off in a flat sliver (about four inches wide) by means of two rollers. This sliver is then conveyed, overhead, from the doffer end of one card, to the feeding apron of the next card in the set, upon which it is passed, flat side down, to and fro, parallel with the feeding rollers. Each ribbon is laid in such a way that each crossing overlaps the preceding one about $1\frac{1}{2}$ inches, thus producing a continuous lap for the feed rollers of the receiving carding engine to work on.

Ribbon Lap Machine: The machine used in cotton spinning (such as is combed) for converting the lap of cotton, as coming from the sliver lap machine, into a more uniform lap for the combing machine (process).

Rib Structures: Ribbed structures are those in which there is a predomi-

nance of one of the two series of threads which constitute the fabric, such as corkscrews, warp and filling ribs, etc., and are produced by (1) a certain order of interlacings, such as ribbed weaves; (2) warp and filling of different thickness; (3) a different number of threads to picks, or *vice versa*.

Rib-top Machine: A knitting machine, adapted to make a rib knitted fabric, such as is used in hosiery, underwear, sweaters, etc.

Rib Weaves: One of the sub-divisions of the plain weave and which may be either a uni or a combination of warp and filling effects. In warp-effects the latter forms the face and back of the fabric with the ribs or ridges running cross-ways in the fabric, the filling resting imbedded, not visible on either side of the fabric. The reverse is the case with filling effects. The respective system of threads which forms the face of the fabric, whether it is the warp or the filling, or both in figured rib weaves, must have a high texture, in order to present a full, close rib effect.

Rice Starch: RICE is used in the finishing and sizing of cotton cloth (also in the sizing of yarn) in two forms, *viz.*, rice flour and rice starch.

RICE FLOUR is simply the grain ground up. Boiled with water, rice flour makes a very mucilaginous paste, rather thicker than that obtained with wheat flour. It has not, however, the same adhesive properties, and hence cannot carry so much china clay, barytes or mineral. It is therefore not much used for heavy finishes, but for light finishes it is in request. RICE FLOUR imparts a peculiar crisp feel to cloth, and is therefore serviceable in those finishes which are not heavily weighed, and which are highly calendered and must be somewhat stiff.

To distinguish between RICE FLOUR and RICE STARCH, place a little of the sample in a test tube, and add a small quantity of nitric acid; IF FLOUR it will become colored a bright yellow; IF STARCH it will remain white.

Richardson's Reagent: An ammoniacal solution of nickel oxide. 25 grams of nickel sulphate crystals are dissolved in 300 c.c. of boiling water and precipitated with a slight excess of a 10 per cent. solution of sodium hydroxide. The precipitate is carefully filtered and washed, then rinsed into a 250 c.c. flask containing 125 c.c. of ammonia (sp. gr.=0.88). The whole is now made up to 250 c.c. with water.

Richelieu Embroidery: White embroidery made with padded outlines in imitation of the Venise laces.

Richelieu Rib: The term applied by the hosiery trade to *drop stitch hosiery*. It refers to the manner of knitting; the *plain rib* or *stitch* of the fabric is interspaced with *drop stitches*, forming a design or *pattern on the stocking*.

Rick-rack: Openwork trimming made with serpentine braid.

Ricotti: Waste silk obtained from the inner smooth skin of the cocoon after reeling.

Rig: The division up the middle of the fleece as made by the wool sorter in sorting for the convenient handling of the wool.

Rigby: An English waterproofing process, usually applied to woolens.

Rigged: The term applied to a piece, folded selvage to selvage.

Rigging: The folding of a piece down the centre (after placing selvage to selvage) so that it may be handled with greater facility.

Rigolette: A light wrap, sometimes worn by women upon the head; a head covering, a scarf rather than a hood, and usually knitted or crocheted of wool.

Rimo: A fine, silky white cotton, grown in the valley of Senegal.

Rim Shaft: The main shaft of a machine.

Ring: An adjunct to the ring frame, secured to the ring rail over the holes provided in it for this purpose. Through its centre extends spindle and bobbin; onto its upper flange is sprung a small piece of bent steel wire, known as the *traveler*, and which is revolved by the action of spindle and yarn, around said ring, at a speed slightly less than that of the spindle, this lag being the means for winding the yarn onto the bobbin.

Ring Frame: The spinning frame (an American invention) in which spindles revolve within rings, the winding of the thread being governed by passing the latter through the eye of a small steel loop, called a *traveler*, one of which revolves around each spindle in the machine. These rings are secured in a horizontal bar, known as the *ring rail*, which moves as directed by the builder motion, up and down, in such a manner as to give respectively what is known as a warp or filling shape to the bobbin (or the cop) as spun on the spindle.

Ring Spinning: Spinning by means of rings and travelers.

Ring Traveler: The small steel loop which forms the winding-on drag of the thread, on the bobbin or cop, in the ring frame.

Rinzu: Silk satin in Japan.

Rio de Janeiro: Variety of raw cotton from Brazil.

Rio Grande: Brazilian cotton having harsh, white staple.

Commercial variety of upland cotton, the staple measuring 18-22 millimeters; the yield is 34-36 per cent.

Ripon Lace: Coarse English bobbin lace, now obsolete.

Ripple: A comb of steel through which flax is drawn to clear off the bolls from the stem. The ripple is a kind of large comb composed of iron teeth about 18 inches long, and $\frac{1}{2}$ inch square, tapering slightly towards the apex, placed $\frac{1}{8}$ of an inch apart at the bottom and screwed down to the centre of a 9 foot plank, resting on two stools. This comparatively great length and smallness of the iron teeth allows them to spring lightly, and so yield to the pull of the stalks, instead of presenting a rigid surface, which would act too roughly upon them. After pulling, flax is submitted to rippling, which has for its object the separation of the bolls from the stems, and is performed by drawing, by hand, successive bundles of flax

through the upright prongs of the ripple. The bolls being greater than the distance apart of the rods, they are stripped off. As each handful of flax is rippled, it is deposited on the ground, one being placed diagonally over the other until a sheaf is completed, when it is bound up and removed for retting.

Rising Box: See Drop Box.

River Plata Wools: Merino wools of the Argentine Republic and Uruguay. They are of fairly fine fibre, but lack in strength and elasticity, and are characterized by the great amount of (screw) burrs they contain. They come rather carelessly graded and packed in the market. The best grades are spun into, up to 60's worsted yarn, the bulk however being destined for 20's to 36's worsted for the hosiery trade as well as for the spinning of woolen yarns for fine finished goods. Also called *Buenos Ayres* or *Montevideo Wools*.

Rivers: General trade names for raw cotton with a good body, measuring from 11-16 to 1½ inches, and grown along the Mississippi and Arkansas rivers.

Rizee: Linen fabric made in Asia Minor, used for veils, shirts, etc.

Robbings: Longer fibres than noil, removed from wool during the operation of combing; these are chiefly produced upon the square-motion comb.

Robes: A name applied to printed twilled cloth, made from 64 square printing cloth. At one time produced in cashmere effects and worn for wrappers, hence the name. Now made in large, bright colored furniture patterns and used for furniture coverings, curtains, and comfortables, and such purposes. Furniture twills and robes are designated thus separately in the trade, though the uses to which they are put are the same. While both are twilled cloths, the term robe signifies that the fabric is made from a 64 square printing cloth.

Robozo: A cotton shawl made in Mexico, being greater in length than in its width, and largely used by women as head-coverings.

Rob Roy: A Highland tartan adapted and worn by Rob Roy. It is composed of alternate red and black stripes of equal width.

Rococo Embroidery: A kind of open-work made with filoselle upon an ecru line foundation; also embroidery made by sewing China ribbons upon a satin or velvet foundation.

Rococo Lace: Italian lace, bearing the rococo design.

Röcky Mountain Goat: A true antelope in all its essential features, though having something of the aspect of the goat, from which it gets its name. Similar to the Cashmere Goat, the woolly fibre of this goat forms an abundant coat beneath long and coarse exterior hairs. The wool, or as it is called *pushm* is of a pure white, but inferior to that of the Cashmere Goat.

Roe: Early maturing commercial variety of upland cotton from Louisiana, the staple measuring 25-30 mm.; the yield is 28-30 per cent.

Roll-boil: The old boiling process, as used extensively in years gone by in order to produce a high finish and lustre to woolen fabrics. In the boiling process, the goods, after proper

gigging and also a thorough wet brushing, are then tightly wound on wooden rollers at the latter machine, a canvas cover being then wound around this roll of cloth and the ends tied. A number of these rolls of cloth thus prepared, are then placed by means of the protruding ends of the wooden rollers in framings in a tank, arranged in such a manner, that the cloth of one roll will not come in contact with that of another roll, neither with the sides of the tank. After the tank is filled with rolls of cloth, water and steam are turned on, so that by the time the tank is filled with water, the same will be quite warm. The tank is then covered and the water allowed to boil, and kept at a moderate boil for a length of time as regulated by the amount of finish required by the goods. The hot water is then drawn off and replaced with cold water and the goods allowed to cool in this, after which the water is drawn off, the rolls of cloth taken out and sent again to the wet brushing-gig and subjected to another thorough wet-brushing, after which they are rolled up again on wooden roller for another boiling, but being this time rolled in the reverse way from before in order to subject both ends of the cloth to about the same amount of boiling. These two boilings form one process, which must be repeated provided not sufficient for a certain finish required, giving a thorough wet brushing each time the goods are intended to go to the tank.

Roll-box: The rotating cylinder of a jack-frame.

Roller Draft: The draft of the rollers is the attenuation or drawing out of roving, brought about by the difference in circumferential speeds between the front, middle, and back rollers. Thus, if one inch of roving be drawn into eight inches, there is said to be eight of a draft.

Roller Gin: A machine for separating the seeds from the cotton fibre by a leather roller working against a blunt-edged doctor knife; used for ginning long staple (Sea Island) cottons.

Roller Laps: Coils of sliver, roving or yarn wrapped on rollers after breakage.

Roller Loom: The roller loom proper is so called because the harnesses are raised or lowered by means of straps passing over rollers, which are worked by an eccentric motion.

Rolling: In lace making, a knot or twist that fastens the thread to the bobbin.

The rolling of a piece on to a board in preparation for the market. The pieces are sometimes measured at the same time for some market. Pieces are also rolled on to a steel plate which is afterwards pulled out.

Roman Stripes: Brilliant contrasting bands of silk filling, woven so as to make a reversible cloth, usually on a cotton warp, none of the warp showing.

Roman Vitriol: See Copper Sulphate.

Romerillo: A dye producing plant found in Ecuador and other tropical countries of America.

Romney Marsh: An English breed of long-wooled sheep, inhabiting from time immemorial, the fen district on the southern coast of Kent, from

which it derives its name. The native breed of this district were large and coarse animals, rather smaller than the Lincoln, but since they have been crossed with the New Leicester they have much improved in every point, and now are represented by a large handsome sheep which yield moderately fine and deep-grown wool. They are also now raised in Australia. The staple attains a fairly deep growth, and the weight of the fleece averages about 9 lb. Also called *Kent Sheep*.

Roncho: A cloak or loose garment, worn by the South American Indians and by many of the Spanish inhabitants of South America.

Rondé: Rounded.

Rongeant: As a pattern made by eating out the designs—corroding.

Root Galls of Cotton: One of the diseases the cotton plant is subjected to, caused by a nematode worm, which, living in the tissues, causes abnormal growths termed *galls*. The injuries produced by the presence of the worm cause distortions of the tissue elements, and in many cases to devitalize the tissues that putrefactive organisms set to work and produce extensive diseased areas. The large amount of nutriment taken also by the roots in the development of the galls lessens the product of the plant. The greatest injury to cotton, however, seems to appear when the disease is accompanied with the *frenching* organism.

Root Rot of Cotton (*Ozonium*): One of the diseases the cotton plant is subjected to, due to fungus diseases. The disease is a true rot caused by one of the higher fungi, the affinities of which are still unknown. Nearly all classes of soil are more or less subject to it. The disease is most prevalent in the central black prairie region of Texas. A white rotten limestone, often cropping out, underlies the entire region. The soil of these black waxy prairie lands is very retentive of moisture, which is a condition favorable to the development of the fungus. The first indication manifested by the cotton plants of the activity of the fungus is the sudden wilting of one or more plants. In passing through the belt where the disease is prevalent a striking contrast is observed between the area made black by the dead plants, everywhere so conspicuous in the fields, and the interspersed green areas of apparently healthy plants; dry weather checks the disease. If the roots of plants just dead from the disease be examined, frequently there are small wart-like bodies on the surface. The fungus derives its nourishment from the living substances of the root, and also in its physiological processes sets up certain fermentations which kill the affected portions, causing partial decomposition, which results in the shrinking of the tissues and the formation of quite extensive depressed areas. The borders of these depressions show at first a red discoloration, which ultimately becomes brown. Near the surface of the soil an enlargement frequently is formed in which elaborate materials are apparently stored during the progress of the disease. From these enlargements

new roots are frequently developed as the lower roots are placed under contribution to the parasite. These help, in favorable weather, to prolong the life of the plant, but are usually not sufficiently developed to prevent the collapse of the plant, when the older roots give way. When the roots become seriously injured, the plant wilts. In the affected areas the disease spreads from year to year in a centrifugal manner, the fungus making its way through the soil from plant to plant. The lint of the diseased cotton is injured, the fibres are wider and the spirals are fewer and more uneven than in lint from healthy plants. The disease cannot be transmitted through the seed. The results of experiments at the Texas Station show that the disease cannot be controlled by any application to the soil at present known. Rotation of crops seems to be the only method which will keep the fungus in check. Corn, sorghum, millet, wheat, oats and other members of the grass family are suggested as desirable crops to grow in rotation with susceptible plants.

Rope Belting: Rope gearing is used to a considerable extent in textile factories. The ropes are usually made from cotton and are made up of four strands twisted round a central core. Each strand is covered spirally with ten twisted cords of cotton yarn which serves as a protecting envelope to the inner or working part of the strand and preserves it from contact and wear without interfering with its flexibility or strength. The minimum size of pulley for rope driving should be not less than 30 times the diameter of rope used.

Rope Walk: A long shed in which ropes are laid on the hand-spinning system.

Roscommon: A sound, fairly big sheep, the wool of which has been largely instrumental in popularizing Irish wool.

Rosea: A variety of the White Mulberry.

Roseaux: A light grayish-green color, like that of the hue of reeds or reed grass.

Rose de Chine: Rose of China; also a very vivid, clear pink color, or a color simulating that of the Chinese rose.

Rosetta: An 18th century woolen fabric in England.

Rostano. Silk fabric, interwoven with gold or silver threads, made in Spain.

Rotary Frame: The power-driven knitting machine.

Rotary Press: The object of pressing is to smoothen the fabric by means of ironing out all the wrinkles and fold, as well as to enhance its beauty of finish. This is accomplished in connection with the rotary press by running the cloth, under heavy pressure, between a press-bed and a weighted revolving cylinder. Either the cylinder may be left cold and the press-bed heated, or *vice-versa* again both may be heated, the latter arrangement being the best, since satisfactory pressing of the fabric can only be had when the press is properly heated, both with reference to cylinder and press-bed, a difference with reference to the final finish having to

be gotten by the variation in this pressure or a final steaming or steam brushing, if such is required. The rotary press is the invention of Lambert Dacier, of Duren, Germany, and was first brought to satisfactory construction on the Continent by Ernst Gessner, Aue, Germany. (See Cloth press.)

Rot Steep: To steep, as cotton fabrics, in water, to remove impurities, before bleaching.

Rotting: See Retting.

Rouane: Bleached household linen in France.

Roughing: See Hackling.

Roughness: This defect in the finishing of cotton fabrics is not a result of calendering, except in the form of threadiness. Roughness, however, if required as a specialty of finish in connection with cotton fabrics is obtained by drying up a heavy filling. There are several rough effects known, as, for instance, the *Cockle Finish* *Thimble Top Effect*, etc.

Rough Peruvian Cotton: See Peruvian Sea Island Cotton.

Round: The English expression for repeat of picks in a weave; for instance: 20 picks to the round.

Roving: The process of drawing before spinning. The thin, slightly twisted wool, cotton, flax, jute or silk sliver, which by drafting and twisting *i. e.*, final spinning, is then transformed into yarn or thread of commerce.

Roving Frame: In cotton spinning, the machine in a set of fly frames in which a number of slubbings or rovings taken either from the slubber or the intermediate frame, respectively, are united, drafted and compacted into roving for delivery to the jack frame in connection with high counts, above 60's, or are taken direct to the ring frame or mule for spinning into yarn or thread of commerce.

Roving Machine: In worsted spinning in connection with Open and French drawing the last machine of the set of drawing machines used. In connection with Open drawing, the slivers from the Reducer are put up at the back of the roving machine; in connection with French drawing the bobbins from the second intermediate frame are put up in the creel of the roving frame. Also called *Rover*, *Roving Head* or *Roving Frame*.

Roving Reel: A device for measuring the length of a roving, sliver, etc. It consists essentially of two flat-faced wheels, between which the sliver is made to pass, the revolutions of one of the wheels, as turned by a crank, recording by a dial the measurement.

Roving Spools: Large wooden spools of a length corresponding to the width of the card, upon which the roving is wound as it comes, in woolen spinning, from the finisher carding engine. Also called *Jack Spools*.

Royal Armure: A narrow, stout silk dress fabric, woven with a pebbled face.

Royal Axminster: A carpet having a tufted cut pile, formed by the loom.

Royale: A modification of Gros de Tours; the rib line, which in the latter extends across the entire width of the cloth, is in Royale, broken off at intervals, after a given number of warp-threads, using what is techni-

cally known as figured rib weaves for interlacing warp and filling.

Royalette: A cloth woven in a five-shaft satin weave, filling face, usually with a cotton warp and botany filling, and heavily picked.

Rubber Cloth: Cotton fabric, rubberized on one side, used for raincoats in the lighter weights, and suit cases and carriage trimmings in the coarse grades.

Rubia: A dye producing plant found in Ecuador and other tropical countries of America.

Rubin: See Fuchsin.

Ruching: A full quilting or pleating of net, lace, ribbon, or other material, used as a trimming for women's garments or worn at the neck or wrists, in widths ranging from 1 to 3 inches. It usually consists of two or more rows of material arranged in box or shell pleats, or in the form quilting.

Rug: A heavy textile covering for a floor, differing from a carpet in that it is properly made in one piece, of a size sufficient to cover only a portion of a floor, often showing rich designs and elaborate workmanship, hence sometimes used for hangings; also, sometimes, a covering made from the skin or skins of an animal dressed with the hair or wool on.

Ruing: The act or process (in the Shetland Islands) of pulling out the wool of the fleece by the root from the live sheep.

Rules of Thumb: Practical, not theoretical, receipts for any process.

Rumal: An India term for a handkerchief, a small square shawl or veil, a silk square used as a headdress, etc.

Rum Cotton: Trade name for cotton grown in the Danish West Indies.

Rumibarba: A dye producing plant found in Ecuador and other tropical countries of America.

Rumswizzel: An Irish fabric made of undyed wool.

Run: One of the systems used for grading woolen yarns, in the United States, as to its counts; the other system used is the *cut* standard. The *run* has for its standard 1600 yards to the hank, and the number of such hanks in 1 lb. is the count of the yarn. In addition to using whole numbers, the run is divided into halves, quarters, and eighths, hence; 200 yards equal $\frac{1}{4}$ run, etc.

Run Lace: Lace made by embroidering with the needle upon a reseau ground. It has been in fashion at different times, and was made extensively in England in the 18th century.

Russel Cord: A worsted cloth of a fine cord twill, first made in Norwich, England.

Russet: A so-called tertiary color, composed of the two secondaries, violet and orange, in equal strength.

Russia Braid: Mohair or silk braid.

Russian Bath Gown: A bath gown made of Turkish toweling of very delicate tissues, with cuffs and hood of chenille and sleeves straight and loose.

Russian Crash: A stout, unbleached, linen fabric, used for toweling, etc.

Russian Tapestry: A stout linen or hempen stuff used for window blinds, etc.

Rust Mordant: See Iron Nitrate.

Rusty Silk: Flaw in white or delicate colored silk cloth, showing fine brownish streaks in the filling.

Ryces: The English name for the swift of a yarn reel.

Ryeland Sheep: An English breed of sheep, preserved from a remote time in the County of Hereford, and from thence has extended itself into Shropshire, Monmouthshire, Gloucester, and Warwickshire, where it has received various names. These sheep are small, without horns, and distinguished for the great fineness of the wool, which is superior for carding purposes to all others which are produced in England, the merino alone excepted. The introduction of fine foreign wool into England has much interfered with the cultivation of this sheep, because any attempts to improve its character so as to compete with this, have resulted either in the deterioration of the sheep for food purposes, or else its deterioration as a wool bearer if the former character was preserved. The cross with the Leicester has been most successful, but the quality of the fleece has been entirely changed and rendered fit for combing purposes.

Weavers Should Study Their Work.

Many persons engaged in the weaving department have the same idea of the necessity of studying the principles and details of their work as some of the farmers, who, when asked why they didn't pay more attention to the cultivation of the potato, innocently answered, "Shure, the potato doesn't need cultivation, it grows itself."

Some of the weavers, loom-fixers and others consider that the loom does the work, and that it is their only duty to watch it and keep the loom going; however a great deal more than that is called for from everyone provided good work is to be produced, and no loss incurred by the manufacturer in having to make allowances on his goods, or selling them below cost, on account of defects caused at the weaving.

Broken picks are very often looked upon by the weaver (who in most instances is a woman or girl) as matters of little moment yet if weavers saw some of their pieces in the finished state, or more especially, if they were asked to buy them, they would probably think very differently. This fault, a most serious one in many classes of goods, and one to be avoided in all, — may arise from many causes, as carelessness in not watching when the bobbin is running out; neglect to find the pick; the filling cutting in the box; cracked bobbins; badly spun yarn, and many other causes. Whenever it arises from any but the first of these, the weaver should call the loom fixer, and in the meantime endeavor to ascertain the primary cause so that she can assist him and save both his time and her own.

There are always pretty clear indications as to the probable cause, such as the filling carrying a certain distance into the piece, breaking-off and catching on again. In such cases, and when the filling stop-motion is not in best condition, and as the loom then does not stop, she doesn't see it until it has gone some distance, and then neither pulls back nor fetches her loom fixer, feeling perhaps, that the blame is not hers.

If the filling is cut in the box it can

easily be determined at which side of the loom it is occurring by the length of yarn carried in and where it catches on again, then the remedy can be easily applied but if she has not observed this the loom fixer may look on for a time and it does not happen. Then he leaves it with the remark, there is nothing wrong; and so it may be with other causes. It should be the weaver's duty to study every little point and have any apparently trifling matter put right before proceeding with her work.

In the same way, with warp-threads breaking down. Very frequently a warp is condemned as bad when there is really nothing the matter with it but poor setting of the loom. The sheds may be unequal in tension; one harness may be rising too high or set too low: the weaver goes on tying ends up, spoiling work and blaming the warp; and at the same time a warp from the same yarn, and weaving the same pattern, is going all right in another loom. What is easier than to observe whether all the threads which break are drawn on the same harness; whether they break at about the same point, or whether they appear to be cut or torn asunder. Observation of these trifles will facilitate the remedying of the evil. An intelligent weaver, if properly directed by her loom fixer, will very soon pay attention to these matters and save trouble for both.

Probably one of the most serious troubles with weavers is when weaving goods that are "cross drafted," that is, when the warp-threads are not drawn in consecutive order through the harnesses. If only one thread is broken at a place there is only one empty heddle, therefore no mistake can be made. However if there are several, she is often at a loss how to draw them in, and although she may think she is doing her best she is in great measure "trusting to Providence," with the result that a stripe, not intended as part of the pattern, runs through the piece and is not discovered until looked over by the percher.

Every weaver should study the draft of the pattern she is weaving and be familiar with it before she has woven many yards. Of course this applies to the weaving of fancy goods. In many cases it must be admitted that the troubles of the weaver are intensified by the manner in which the designer arranges his drafts, making them more complicated than they need be, though he may not be always at fault.

The loom fixer is as much at fault in this respect as the weaver, in many cases, and it would pay the manufacturers of fancy goods to have all their loom fixers take a course of instruction in the arrangement of elementary designs, and the principles of drawing-in drafts under a competent person, and insist that as every new warp goes into a loom he should instruct the weaver in the draft of that particular pattern. Many mistakes would be avoided and consequently fewer spoilt pieces.

Much more might be said about the weaver, but a few words must be said of others. The loom fixer in many cases underrates his responsibility. It should be his duty to see that every weaver not only knows her work, but properly attends to it, and report to him the slightest fault occurring in the working of the loom, and to immediately correct it.

Every new style of goods coming to him should be carefully considered so as to know exactly how to set the loom to weave it to the best advantage, and to discover also, if it should start up badly, what is the probable cause. It may be the setting of the loom, the improper tension on the sheds, as in case of these being a heavy one and a light one, as with a cloth where all the warp is on the face or the reverse, where the pattern makes a sudden change, etc.

One example quoted will show what is meant by this. In weaving for example a plain ribbed cloth (with 3 picks in each shed) and where the rib runs across the piece *i.e.*, in the direction of the filling, and where each shed remains open for those three picks, except, it may be, that a binder warp-thread is used as is often the case; then there is a complete change, all the threads reversing their positions. If the warp is of a rough or fibrous character the first pick after the crossing *i.e.* shed of the warp-threads will not be clear, and a pick thrown in then is liable to skip a good many warp-threads, and produce serious faults.

A careful loom fixer will at once determine what to do. He may send an empty shuttle through the first shed of the three picks, to clear it so that the shuttle carrying the yarn in the following pick will not be obstructed by the entangled fibres, and there will be little danger of its passing over or under threads which it ought not to pass over or under. There will of course be some loss of production, but this will be more than compensated for in good cloth.

So far, these remarks apply only to the general observations of the loom fixer and his duties to the weaver, but there is much more for him to observe in the details of the working parts of the loom. It should not be sufficient for him to let a loom go as long as it will run at all. It is not sufficient, if the shuttle is not flying out, to say the picking arrangement is in good order. He may be wearing out picking straps, pickers, shuttles, or giving the loom double the amount of work to do that is necessary. It is his duty to see that every part is properly set so that he is not exercising undue force in sending the shuttle across the loom, and causing violent reaction when the pick is delivered, but that the action is as smooth as possible with no more force to get the shuttle out of one box and into the other than is necessary in the proper time. It is well known that there is no part of the loom which can give more trouble, and be the cause of more wear and tear, not only to the picking arrangement itself, but to the whole loom, than a badly set picking motion.

This is merely mentioned as one item, but every part of the loom should receive equally careful attention. Not only that, but the timing of the several parts in relation to one another.

Probably no part of the work has more influence upon the production of a good cloth than the timing of the opening and closing of the shed in relation to the beating up of the filling by the reed. Every good loom fixer knows that there can be no fixed rule laid down for this which will apply to all classes of fabrics; but careful observation will enable him to determine with some degree of precision what the relations should be for any

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